AMENDMENTS TO THE CLAIMS

1. (Canceled)

2. (Currently amended) The process of claim [[1]] 22, wherein the concentration of said diluent is decreased as the thickness of said layer increases.

3. (Currently amended) The process of claim [[1]] 22, wherein the concentration of said diluent is varied in a stepwise manner as the thickness of said layer increases.

4. (Currently amended) The process of claim [[1]] 22, wherein the concentration of said diluent is varied as a continuous function of the thickness of the layer.

5. (Currently amended) The process of claim [[1]] 22, wherein said microcrystalline semiconductor material includes a group IV element.

6. (Currently amended) The process of claim [[1]] 22, wherein said process gas comprises a member selected from the group consisting of: SiH_4, Si_2H_6, GeH_4, SiF_4, GeF_4 or combinations thereof.

7. (Currently amended) The process of claim [[1]] 22, wherein said diluent is selected from the group consisting of hydrogen, deuterium, a halogen or combinations thereof.

8. (Currently amended) The process of claim [[4]] 22, wherein said diluent comprises hydrogen.

9. (Currently amended) The process of claim [[1]] 22, wherein said electromagnetic energy is microwave energy.

10. (Currently amended) The process of claim [[1]] 22, wherein said electromagnetic energy is radiofrequency energy.

11. (Currently amended) The method of claim [[1]] 22, wherein the step of varying the concentration of the diluent in the process gas comprises changing the amount of the diluent in said process gas.

12. (Currently amended) The method of claim [[1]] 22, wherein the step of varying the concentration of the diluent in the process gas comprises changing the amount of the semiconductor precursor in the process gas.

13. (Currently amended) The process of claim [[1]] 22, including the further step of varying at least one ~~other~~ of said deposition ~~parameter~~ parameters as a function of the thickness of the layer of microcrystalline semiconductor material which has been deposited~~, said other deposition parameter being selected from the group consisting of: process gas pressure, power density of said electromagnetic energy, frequency of said electromagnetic energy, or substrate temperature~~.

14. (Currently amended) The process of claim [[1]] 22, wherein said semiconductor material includes silicon and germanium therein and wherein said process gas includes a silicon-containing compound, a germanium-containing compound, and a diluent selected from the group consisting of hydrogen, deuterium or combinations thereof, and wherein the ratio of said silicon-containing compound to said germanium-containing compound is varied while said semiconductor material is being deposited so that the silicon/germanium ratio of said layer of semiconductor material varies as a function of layer thickness; and wherein the concentration of said diluent gas in the process gas is increased as the ratio of said germanium-containing compound to said silicon-containing compound therein increases.

15-21 (Canceled)

22. (New) A method for the plasma deposition of a layer of a microcrystalline semiconductor material, said method comprising the steps of:

providing a deposition chamber;

providing a process gas mixture which includes a precursor of a semiconductor material and a concentration of a diluent;

disposing a substrate in the deposition chamber;

introducing the process gas into the deposition chamber;

energizing the process gas in the chamber with electromagnetic energy so as to create a plasma therefrom which decomposes at least some of the components of the process gas so as to deposit a layer of said semiconductor material onto the substrate;

controlling at least one deposition parameter of said deposition process so that the layer of semiconductor material which is deposited onto the substrate in said deposition process is microcrystalline, said at least one parameter being selected from the group consisting of: the composition of the process gas; the pressure of the process gas; the power density of the electromagnetic energy; the frequency of the electromagnetic energy; and the temperature of the substrate; and

varying the concentration of said diluent in said process gas as a function of the thickness of the layer of microcrystalline semiconductor material which has been deposited onto said substrate.